Panasonic
ideas for life

**Compliant with European standards 1a1b 10A/8A polarized power relays**

# DE RELAYS (ADE)

**Compliance with RoHS Directive**

## FEATURES

**1. Conforms to European safety standard (VDE0700 and VDE0631).**
Insulating distance between coil and contacts:
Clearance Min. 8mm .315 inch
Creepage Min. 8mm .315 inch
**2. Low operating power**
Nominal operating power at 200 mW (Single side stable, 2 coil latching)
**3. Compact body saves space**
Size: 12.5(W) × 25(L) × 12.5(H) mm
.492(W) × .984(L) × .492(H) inch
**4. Conforms to the various safety standards**
UL, CSA and VDE approved

## TYPICAL APPLICATIONS

1. Temperature controller
2. Automatic meter reading
3. OA equipment
4. FA equipment

## ORDERING INFORMATION

ADE □ □ □

DE relay

Contact arrangement
1: 1 Form A
2: 2 Form A
3: 1 Form A 1 Form B

Operating function
0: Single side stable
2: 2 coil latching

Nominal coil voltage (V DC)
3: 12V, 4: 24V, 9: 5V

Notes: 1. Certified by UL, CSA and VDE
2. This product is manufactured by lot after an order is received.

## TYPES

| Contact arrangement | Nominal coil voltage | Single side stable type | 2 coil latching type |
|---|---|---|---|
| | | Part No. | Part No. |
| 1 Form A | 5V DC | ADE109 | ADE129 |
| | 12V DC | ADE103 | ADE123 |
| | 24V DC | ADE104 | ADE124 |
| 1 Form A 1 Form B | 5V DC | ADE309 | ADE329 |
| | 12V DC | ADE303 | ADE323 |
| | 24V DC | ADE304 | ADE324 |
| 2 Form A | 5V DC | ADE209 | ADE229 |
| | 12V DC | ADE203 | ADE223 |
| | 24V DC | ADE204 | ADE224 |

Standard packing: Tube package: 20 pcs.; Case: 500 pcs.
Note: This product is manufactured by lot after an order is received.

# RATING

## 1. Coil data

1) Single side stable type

| Nominal coil voltage | Pick-up voltage (at 20°C 68°F) | Drop-out voltage (at 20°C 68°F) | Nominal operating current [±10%] (at 20°C 68°F) | Coil resistance [±10%] (at 20°C 68°F) | Nominal operating power | Max. applied voltage (at 20°C 68°F) |
|---|---|---|---|---|---|---|
| 5V DC | 70%V or less of nominal voltage (Initial) | 10%V or more of nominal voltage (Initial) | 40 mA | 125Ω | 200mW | 130%V of nominal voltage |
| 12V DC | | | 16.6mA | 720Ω | | |
| 24V DC | | | 8.3mA | 2,880Ω | | |

2) 2 coil latching type

| Nominal coil voltage | Set voltage (at 20°C 68°F) | Reset voltage (at 20°C 68°F) | Nominal operating current [±10%] (at 20°C 68°F) | | Coil resistance [±10%] (at 20°C 68°F) | | Nominal operating power | | Max. applied voltage (at 20°C 68°F) |
|---|---|---|---|---|---|---|---|---|---|
| | | | Set coil | Reset coil | Set coil | Reset coil | Set coil | Reset coil | |
| 5V DC | 70%V or less of nominal voltage (Initial) | 70%V or less of nominal voltage (Initial) | 40 mA | 40 mA | 125Ω | 125Ω | 200mW | 200mW | 130%V of nominal voltage |
| 12V DC | | | 16.6mA | 16.6mA | 720Ω | 720Ω | | | |
| 24V DC | | | 8.3mA | 8.3mA | 2,880Ω | 2,880Ω | | | |

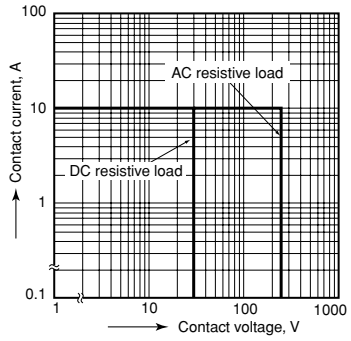
## 2. Specifications

| Characteristics | Item | | Specifications | | |
|---|---|---|---|---|---|
| Contact | Arrangement | | 1 Form A | 1 Form A 1 Form B | 2 Form A |
| | Contact resistance (Initial) | | Max. 30 mΩ (By voltage drop 6 V DC 1A) | | |
| | Contact material | | $AgSnO_2$ type | | |
| Rating | Nominal switching capacity (resistive load) | | 10A 250V AC, 10A 30V DC | 8A 250V AC, 8A 30V DC | |
| | Max. switching power (resistive load) | | 2,500VA, 300W | 2,000VA, 240W | |
| | Max. switching voltage | | 250V AC, 30V DC | 250V AC, 30V DC | |
| | Max. switching current | | 10A | 8A | |
| | Nominal operating power | | 200mW | | |
| | Min. switching capacity*1 | | 100mA 5V DC | | |
| Electrical characteristics | Insulation resistance (Initial) | | Min. 1,000MΩ (at 500V DC) Measurement at same location as “Breakdown voltage” section. | | |
| | Breakdown voltage (Initial) | Between open contacts | 1,000 Vrms for 1 min. (Detection current: 10 mA) | | |
| | | Between contact sets | — | 4,000 Vrms for 1 min. (Detection current: 10 mA) | |
| | | Between contact and coil | 5,000 Vrms for 1 min. (Detection current: 10 mA) | | |
| | Surge breakdown voltage*2 (Between contact and coil) (Initial) | | 12,000 V | | |
| | Temperature rise (coil) (at 70°C 158°F) | | Max. 50°C 122°F (By resistive method) | | |
| | Operate time [Set time] (at 20°C 68°F) | | Max. 10 ms [Max. 10 ms] (Nominal coil voltage applied to the coil, excluding contact bounce time.) | | |
| | Release time [Reset time] (at 20°C 68°F) | | Max. 5 ms [Max. 10 ms] (Nominal coil voltage applied to the coil, excluding contact bounce time.) (without diode) | | |
| Mechanical characteristics | Shock resistance | Functional | Min. 196 m/s² (Half-wave pulse of sine wave: 11 ms; detection time: 10μs.) | | |
| | | Destructive | Min. 980 m/s² (Half-wave pulse of sine wave: 6 ms.) | | |
| | Vibration resistance | Functional | 10 to 55 Hz at double amplitude of 2 mm (Detection time: 10μs.) | | |
| | | Destructive | 10 to 55 Hz at double amplitude of 3 mm | | |
| Expected life | Mechanical | | Min. $10^7$ (at 300 times/min.) | | |
| | Electrical | | Min. $10^5$ (resistive load, at 20 times/min., at nominal switching capacity) | | Min. $10^5$ (resistive load, at 20 times/min., at AC nominal switching capacity) Min. $5\times10^4$ (resistive load, at 20 times/min., at DC nominal switching capacity) |
| Conditions | Conditions for operation, transport and storage*3 | | Ambient temperature: –40°C to +70°C –40°F to +158°F; Humidity: 5 to 85% R.H. (Not freezing and condensing at low temperature) | | |
| | Max. operating speed | | 20 times/min. (at nominal switching capacity) | | |
| Unit weight | | | Approx. 7 g .25 oz | | |

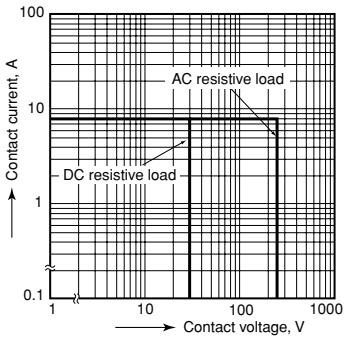
Notes: *1. This value can change due to the switching frequency, environmental conditions, and desired reliability level, therefore it is recommended to check this with the actual load.
*2. Wave is standard shock voltage of ±1.2×50μs according to JEC-212-1981
*3. The upper limit of the ambient temperature is the maximum temperature that can satisfy the coil temperature rise value. Refer to Usage, transport and storage conditions in NOTES.

## REFERENCE DATA

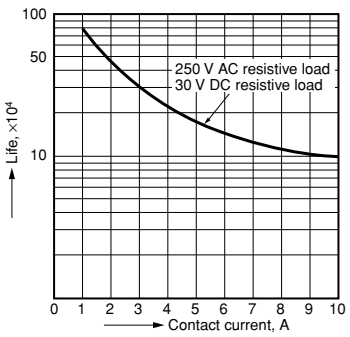
1.-(1) Maximum switching power (1 Form A)



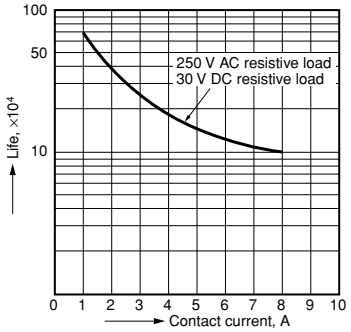

1.-(2) Maximum switching power (1 Form A 1 Form B, 2 Form A)



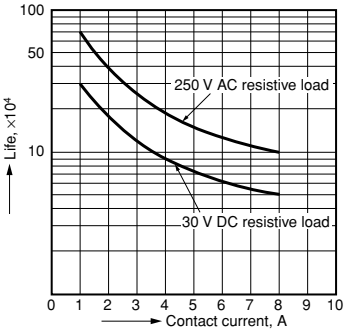

2.-(1) Life curve (1 Form A)



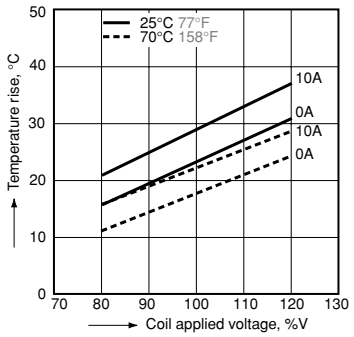

2.-(2) Life curve (1 Form A 1 Form B)



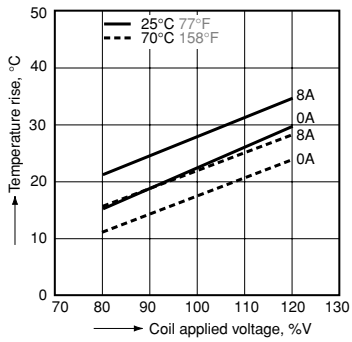

2.-(3) Life curve (2 Form A)



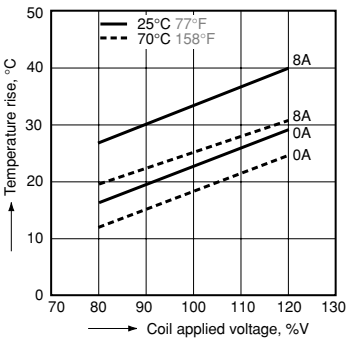

3.-(1) Coil temperature rise (1 Form A)
Tested sample: ADE109
Quantity: n=6
Ambient temperature: 25°C to 70°C 77°F to 158°F



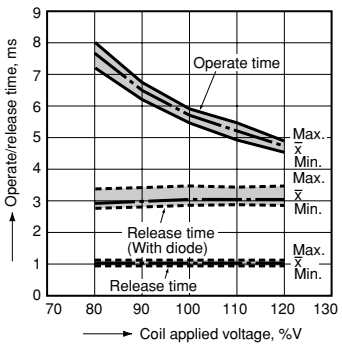

3.-(2) Coil temperature rise (1 Form A 1 Form B)
Tested sample: ADE309
Quantity: n=6
Ambient temperature: 25°C to 70°C 77°F to 158°F



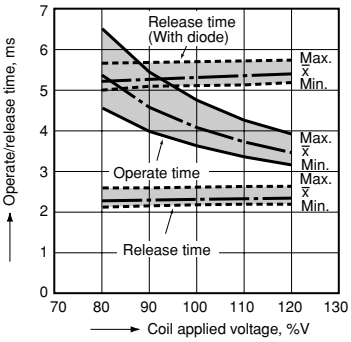

3.-(3) Coil temperature rise (2 Form A)
Tested sample: ADE209
Quantity: n=6
Ambient temperature: 25°C to 70°C 77°F to 158°F



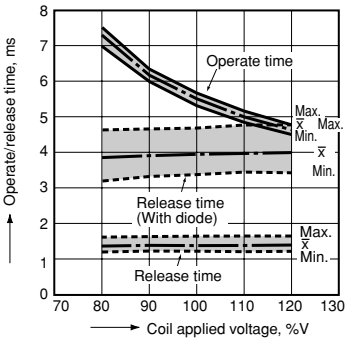

4.-(1) Operate/release time (1 Form A)
Tested sample: ADE109
Quantity: n=5



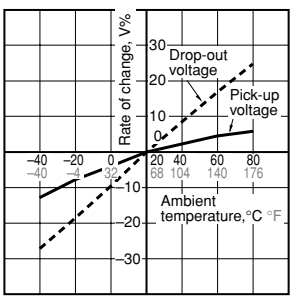

4.-(2) Operate/release time (1 Form A 1 Form B)
Tested sample: ADE309, Quantity: n=5



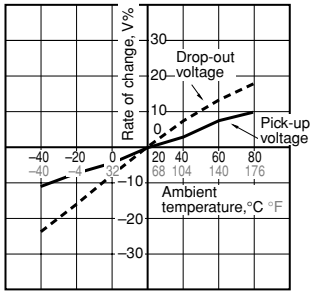

4.-(3) Operate/release time (2 Form A)
Tested sample: ADE209, Quantity: n=5



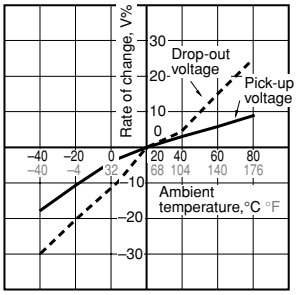

5.-(1) Ambient temperature characteristics (1 Form A)
Tested sample: ADE109, Ambient temperature: –40°C to 80°C –40°F to 176°F, Quantity: n=6



5.-(2) Ambient temperature characteristics
(1 Form A 1 Form B)
Tested sample: ADE309, Ambient temperature:
–40°C to 80°C –40°F to 176°F, Quantity: n=6




5.-(3) Ambient temperature characteristics
(2 Form A)
Tested sample: ADE209, Ambient temperature:
–40°C to 80°C –40°F to 176°F, Quantity: n=6

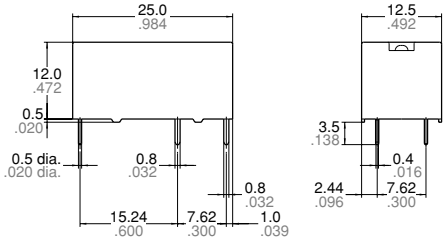



## DIMENSIONS (mm inch)

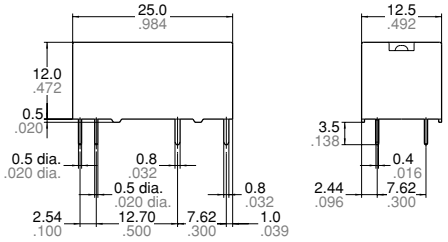
The CAD data of the products with a **CAD Data** mark can be downloaded from: http://panasonic-electric-works.net/ac

**CAD Data**

External dimensions
Single side stable

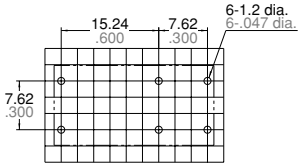



2 coil latching type

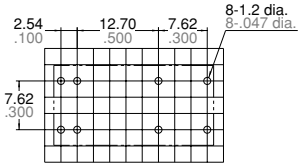



Tolerance: ±0.3 ±.012

PC board pattern (Bottom view)
Single side stable



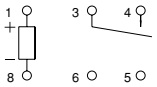

2 coil latching type




Tolerance : ±0.1 ±.004

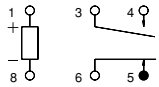
Schematic (Bottom view)
Single side stable

(1 Form A)



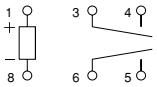

(5,6: dummy terminal)

(1 Form A 1 Form B)



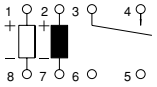

(Deenergized condition)

(2 Form A)



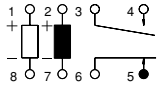

2coil latching type

(1 Form A)



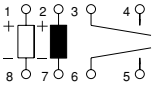

(5,6: dummy terminal)

(1 Form A 1 Form B)




(Reset condition)

(2 Form A)




## SAFETY STANDARDS

| Item | UL/C-UL (Recognized) | | CSA (Certified) | | VDE (Certified) | |
|---|---|---|---|---|---|---|
| | File No. | Contact rating | File No. | Contact rating | File No. | Contact rating |
| 1 Form A | E120782 | PILOT DUTY B300<br>R300 | LR85932 | PILOT DUTY B300<br>R300 | 115944 | 8A 250V AC (cos$\phi$=1.0) |
| 1 Form A<br>1 Form B | E120782 | PILOT DUTY B300<br>R300 | LR85932 | PILOT DUTY B300<br>R300 | 115944 | 8A 250V AC (cos$\phi$=1.0) |
| 2 Form A | E120782 | PILOT DUTY B300<br>R300 | LR85932 | PILOT DUTY B300<br>R300 | 115944 | 8A 250V AC (cos$\phi$=1.0) |

## For Cautions for Use.